



[10191/1157]

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BOARD OF PATENT APPEALS AND INTERFERENCES

----- X  
In re Application of:

KLAUS ZIMMERMANN et al.

For: METHOD AND DEVICE FOR  
ACTIVATING AN  
ELECTROMAGNETIC CONSUMER:

Filed: November 2, 1999

Serial No.: 09/432,338

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Commissioner for Patents  
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Art Unit: 3754  
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**APPEAL BRIEF TRANSMITTAL (33,865)  
AND PETITION TO EXTEND**

SIR:

Accompanying this Appeal Brief Transmittal is an Appeal Brief pursuant to 37 C.F.R. § 1.192(a) in triplicate for filing in the above-identified patent application.

This is also a **Petition To Extend** Under 37 C.F.R. § 1.136(a) to extend the two-month response date by **one (1) month** from the two-month date of December 26, 2004 to January 26, 2005 (the Notice of Appeal was mailed on October 21, 2004 and filed in the Patent Office on October 26, 2004, which makes the two-month date of December 26, 2004).

Please charge the appropriate fees of **\$620.00**, which includes the Appeal Brief fee under 37 C.F.R. § 1.17(c) (which is believed to be \$500.00) and the Rule 136(a) extension fee (which is believed to be \$120.00 for a one-month extension), to Deposit Account No. **11-0600**. The Commissioner is also authorized, as necessary and/or appropriate, to charge any additional and appropriate fees, including any further Rule 136(a) extension fees, or credit any overpayment to Deposit Account No. **11-0600**. Two duplicate copies of this transmittal are enclosed for that purpose.

Respectfully submitted,

Dated: 1/26/2005

By: Richard L. Mayer

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U.S. Pat. App. Ser. No. 09/432,338  
Attorney Docket No. 10191/1157  
Appeal Brief

[10191/1157]

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
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: Examiner: Eric S. Keasel  
KLAUS ZIMMERMANN et al. :  
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on

Date:

Signature:

AARON C. DEDITCH

(33,865)

**APPEAL BRIEF PURSUANT TO 37 C.F.R. § 1.192(a)**

SIR:

In the above-identified patent application ("the present application"), Appellants mailed a Notice Of Appeal on October 21, 2004 (which was filed by the Patent Office on October 26, 2004) from the Final Office Action issued by the U.S. Patent and Trademark Office on April 21, 2004, so that the two-month appeal brief due date is December 26, 2004. The two-month appeal brief filing date has been extended by one month from December 26, 2004 to January 26, 2005 by the accompanying Transmittal And Petition To Extend. In the Final Office Action, claims 83 to 85 and 87 to 90 (since claim 86 was canceled in the Supplemental Amendment filed on July 13, 2004 and later entered by Examiner Keasel) were finally rejected.

An Amendment After A Final Office Action and a Supplemental Amendment After A Final Office Action were mailed on June 8, 2004 and July 13, 2004, respectively. Advisory Actions were mailed on June 23, 2004 and again on October 22, 2004 (in connection with the Supplemental Amendment of July 13, 2004).

In accordance with 37 C.F.R. § 1.192(a), this Appeal Brief is being submitted in triplicate in support of the appeal of the final rejections of claims 83 to 85 and 87 to 90. It is respectfully submitted that the final rejections of these claims should be reversed for the reasons set forth below.

**1. REAL PARTY IN INTEREST**

The real party in interest in the present appeal is Robert Bosch GmbH (“Robert Bosch”) of Stuttgart in the Federal Republic of Germany. Robert Bosch is the assignee of the entire right, title and interest in the present application.

**2. RELATED APPEALS AND INTERFERENCES**

There are no interferences or other appeals related to the present application, which “will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal”.

**3. STATUS OF CLAIMS**

1. Claims 83 to 85 and 87 to 90 were finally rejected under the first paragraph of 35 U.S.C. § 112 as to the written description requirement.

2. Claims 83 to 85 and 87 to 90 were finally rejected under the second paragraph of 35 U.S.C. § 112 as indefinite.

3. Claims 83 to 85 and 87 to 90 were finally rejected under 35 U.S.C. § 102(b) as anticipated by Rehlichler, U.S. Patent No. 5,592,921 (“the Rehlichler reference”).

4. Claims 83 to 85 and 87 to 90 were finally rejected under 35 U.S.C. § 102(b) as anticipated by Fischer et al., GB 2311559 (“the Fischer reference”).

A copy of the appealed claims (*excluding withdrawn claims 8 to 82*) is attached hereto in the Appendix.

**4. STATUS OF AMENDMENTS**

In response to the Final Office Action mailed on April 21, 2004, Appellants filed an Amendment After A Final Office Action, which was mailed on June 8, 2004, and a Supplemental Amendment After A Final Office Action on July 13, 2004.

## **5. SUMMARY OF THE INVENTION**

The problem addressed by the presently claimed subject matter is found, for example, in the method and a device for activating an electromagnetic consumer of German Patent No. 44 20 282, which discusses a device for activating a consumer that includes a movable element. The consumer is a solenoid valve for controlling the metering of fuel into an internal combustion engine. Within a time window, a switching instant at which the movable element reaches a certain position is detected. This is accomplished by analyzing a time characteristic of a quantity corresponding to the current flowing through the consumer. During the time window when the current is being analyzed, the voltage applied to the consumer is regulated or controlled at a constant value. (See specification, page 1, lines 1 to 10).

In the cold start phase, the leads to the consumer have a low resistance, so the currents reach a higher level at a constant voltage than in normal operation. If current monitoring is provided to switch off the output stage after the current reaches a certain threshold value, this can lead to the output stage being disconnected by the current monitor. This may be problematic when the consumer is connected to the power supply during the time window when the switching instant is detected. The current flowing through the consumer rises to different levels depending on the duration of the time window. (See specification, page 1, lines 12 to 20).

The exemplary embodiment(s) of the present invention are described below using the example of an electromagnetic consumer.

The consumer is in particular a solenoid valve for controlling the metering of fuel into an internal combustion engine. The consumer includes a movable element which is usually called a valve needle in the case of a solenoid valve. Figure 1 illustrates the device according to the present invention on the basis of a block diagram. A first terminal of a consumer 100 is connected to a power supply U<sub>bat</sub>, and the second terminal of consumer 100 is connected to the first terminal of switching arrangement 110. The second terminal of a switching arrangement 110 is connected to the first terminal of a current measuring arrangement 120. The second terminal of the current measuring arrangement is connected to ground. The terminals of consumer 100 and the terminals of current measuring arrangement 120 send

signals to a control unit 130, which in turn sends a control signal A to switching arrangement 110. (See specification, page 2, lines 18 to 31).

In the exemplary embodiment, consumer 100, switching arrangement 110 and current measuring arrangement 120 are connected in series in that order. This order is given only as an example. The three elements may also be arranged in another order. Thus, the switching arrangement may also be arranged between the power supply voltage and the consumer. In addition, current measuring arrangement 120 may be arranged between switching arrangement 110 and consumer 100 or between consumer 100 and the power supply voltage. In addition, additional switching arrangement may be provided, for example, between consumer 100 and the power supply voltage. Switching arrangement 110 may be implemented in the form of a transistor, in particular a field effect transistor. Current measuring arrangement 120 may be an ohmic resistor. Consumer 100 may be the coil of a solenoid valve which is used to meter fuel. (See specification, page 3, lines 1 to 15).

In Figure 2a, current I flowing through consumer 100 and through current measuring arrangement 120 is detected and plotted over time. Figure 2a illustrates metering or an injection process. Control of consumer 100 begins at time t1. At this time t1, current I rises steeply. At time t2, a first value S1 is reached. At this time the switching arrangement opens. If the current drops by a certain value, switching arrangement 110 closes and the current rises again to value S1. Value S1 is also called the starting current. The period of time between time t1 and time t2 is known as the free current ramp. Following this, the current is adjusted to the starting current. A time window within which switching arrangement 110 is constantly in a closed state begins at time t3. This results in a current rise. The movable element reaches its new end position at time tBIP because of the magnetic force. This results in a change in the consumer's inductance, which then causes a change in the current rise. The time window ends at time t4. After time t4, the current is regulated at a second value S2. This value is also referred to as the holding current. Control of the consumer ends at time t5, when switching arrangement 110 is opened and the current drops to 0 by time t6. (See specification, page 3, line 17 to page 4, line 6).

The current variation is shown only schematically and may also assume different forms with other types of solenoid valves or other control methods. In particular the curve

shape while reaching the new end position at time  $t_{BIP}$  may be different. It is important that the current characteristic has a break and/or a discontinuity at switching instant  $t_{BIP}$ . This break may be detected by current analysis. One problem now is that switching arrangement 110 is closed constantly during time  $t_3$  to  $t_4$ . Therefore, the current rises very steeply in this period of time with a low ohmic resistance of consumer 100. This can lead to the maximum allowed current value being exceeded and the output stage being disconnected, i.e., switching arrangement 110 is permanently open. Times  $t_3$  and  $t_4$  define a time window within which the switching instant is detected. Switching arrangement 110 is in its closed state within the time window. Switching instant  $t_{BIP}$  is detected by analysis of the current curve within the time window. During the time window, which is defined by times  $t_3$  and  $t_4$ , consumer 100 receives power supply voltage  $U_{bat}$  and the time curve of the current is analyzed to determine the switching time. Due to the fact that the consumer receives the power supply voltage in the time window, control in the time window is greatly simplified and no voltage control is necessary. (See specification, page 4, lines 8 to 27).

The limits for time window  $t_3$  and  $t_4$  may be defined on the basis of switching instant  $t_{BIP}$  of the preceding control and width  $B$  of the time window. The calculation may be performed according to the equation:  $t_3 = t_{BIP} - B/2$  and  $t_4 = t_{BIP} + B/2$ . Width  $B$  of the time window is defined as shown in Figure 3. The current rise during the time window is limited according to the exemplary embodiment of the present invention by the definition of the time window, i.e., the interval between times  $t_3$  and  $t_4$ . This takes place in particular on startup of the internal combustion engine. Figure 2b shows the duration of the time window plotted against time with a solid line. Maximum value  $I_B$  of current  $I$ , which is detected just before time  $t_4$ , is plotted with a broken line. In addition, threshold value  $SW$  is plotted with a double line. The relationships in normal undisturbed operation are shown. (See specification, page 4, line 29 to page 5, line 13).

At time 0, i.e., when starting up the internal combustion engine, a minimal value  $B_{MIN}$  for the duration of the time window is defined, i.e., in the interval between  $t_3$  and  $t_4$ . Maximum value  $I_B$  of the current is definitely below threshold value  $SW$ . Consequently, a larger value is defined for the time window at the next injection. This means that duration  $B$  of the time window increases several steps over time until reaching a maximum value

BMAX. The BMIN value is selected so that even under unfavorable conditions, maximum current IB is no greater than threshold value SW. Maximum value IB of the current increases simultaneously with the increase in duration B of the time window. However, the maximum value does not reach threshold value SW. Threshold value SW is selected so that it is slightly less than the maximum allowed current value at which the current monitor responds. Figure 2b also shows that threshold value SW is not constant but instead it is defined as a function of battery voltage Ubat received by the consumer. As shown in Figure 2b, this value increases slowly during the startup operation. Figure 3 illustrates the procedure according to the present invention on the basis of a flow chart. The procedure according to the present invention may be performed only once after starting the internal combustion engine. This means that the program begins at step 300 after starting the internal combustion engine. (See specification, page 5, line 15 to page 6, line 4).

In the next step 310, value B for the time window is set at minimum value BMIN. Subsequent query 320 determines whether the maximum value of current IB is greater than threshold value SW. If this is not the case, i.e., maximum value IB of the current is lower than threshold value SW, then time window B is increased by value X in step 330. Maximum value IB of the current corresponds to the current intensity prevailing at time t4. If it is difficult or impossible to detect this with the measurement technology, a current intensity immediately before time t4 may also be used as maximum value IB. Maximum value IB of the current corresponds to the greatest current intensity measured in the time window. Maximum value IB of current I may be determined immediately before the end of the time window (t4). Subsequent query 340 determines whether width B of the time window is greater than maximum value BMAX. If this is the case, the program ends at step 350. If this is not the case, query 320 is performed again. In normal operation, program steps 320, 330 and 340 are run through several times until width B of the time window has reached maximum value BMAX. If this is the case, the procedure is terminated. (See specification, page 6, lines 6 to 23).

If query 320 detects that maximum value IB of the current is greater than threshold value SW, then width B of the window is reduced by value Y in step 360. Subsequent query 370 determines whether width B is less than or equal to minimum value BMIN. If this is not

the case, query 320 is performed again. If this is the case, width B is set at minimum value BMIN in step 380, and query 320 is performed again. This means that if maximum value IB of the current is greater than threshold value SW, width B of the window is reduced by value Y until maximum value IB of the current is lower than the threshold value. Measures may be taken to prevent the value from dropping below minimum value BMIN. According to the present invention, the duration of the time window is increased starting from a starting value (BMIN) if the current is lower than the threshold value. The duration of the time window is increased until reaching a maximum value (BMAX) for the duration. The duration of the time window is reduced if the current is greater than the threshold value. (See specification, page 6, line 24 to page 7, line 10).

In summary, the present invention is directed to a method of activating an electromagnetic consumer having a movable element, the electromagnetic consumer being a solenoid valve for controlling a metering of fuel into an internal combustion engine, the method comprising: determining within a time window a switching instant at which the movable element has reached a certain position; defining a duration of the time window so that the current flowing through the consumer during the time window does not exceed a threshold value; and reducing the duration of the time window if the current is greater than the threshold value. (See claim 83).

The present invention is also directed to an arrangement for activating an electromagnetic consumer having a movable element, the electromagnetic consumer being a solenoid valve for controlling a metering of fuel into an internal combustion engine, the arrangement comprising: a determining arrangement to determine within a time window a switching instant at which the movable element has reached a certain position, and to define a duration of the time window so that the current flowing through the consumer during the time window does not exceed a threshold value; and a reducing arrangement to reduce the duration of the time window if the current is greater than the threshold value. (See claim 88).

## **6. ISSUES**

1. Under the first paragraph of 35 U.S.C. § 112, are claims 83 to 85 and 87 to 90 lacking as to the written description requirement?



2. Under the second paragraph of 35 U.S.C. § 112, are claims 83 to 85 and 87 to 90 indefinite?

3. Under 35 U.S.C. § 102(b), are claims 83 to 85 and 87 to 90 anticipated by Rehlichler, U.S. Patent No. 5,592,921 (the “Rehlichler” reference)?

4. . Under 35 U.S.C. § 102(b), are claims 83 to 85 and 87 to 90 anticipated by Fischer et al., GB 2311559 (the “Fischer” reference)?

## **7. GROUPING OF CLAIMS**

Issue 1 - Group 1: Claims 83 to 85 and 87 to 90 stand or fall together as to the written description rejection.

Issue 2 - Group 1: Claims 83 to 85 and 87 to 90 stand or fall together as to the indefiniteness rejections.

Issue 3 - Group 1: Claims 83 to 85 and 87 to 90 stand or fall together as to the anticipation rejections based on the “Rehlichler” reference.

Issue 4 - Group 1: Claims 83 to 85 and 87 to 90 stand or fall together as to the anticipation rejections based on the “Fischer” reference.

## **8. ARGUMENT**

### **Issue 1 – Written Description Rejections**

Claims 83 to 85 and 87 to 90 were rejected under the first paragraph of 35 U.S.C. § 112 as to the written description requirement.

It is first noted that the Office bears the initial burden of presenting “evidence or reasons why persons skilled in the art would not recognize in an applicant's disclosure a description of the invention defined by the claims.” (See M.P.E.P. § 2163.04 (citing In re Wertheim 541 F.2d 257, 262, 265, 191 U.S.P.Q. 90, 96, 98 (C.C.P.A. 1976))) (emphasis added). The Manual of Patent Examining Procedure also provides that if an examiner rejects a claim based on the lack of a written description, the examiner should “identify the claim

limitation not described” and also provide “reasons why persons skilled in the art would not recognize the description of this limitation in the disclosure of the application.” (See id.). In this regard, the Office Action does not explain why a person skilled in the art would not recognize the features of claim 83 and claim 88 that a duration of a time window is defined such that a current flowing through the consumer does not exceed a threshold value and that the duration of the time window is reduced when the current is greater than the threshold value. In this regard, the Specification specifically provides the following:

Disconnection of the output stage current during detection of the switching instant is avoided through the procedure according to the present invention. The time window within which the switching instant is detected is *defined* in such a way that detection of the switching instant is possible, yet, the current does not rise to unacceptably high levels.

(See Specification, page 2, lines 1 to 5). In addition, the Specification provides that:

According to the present invention, the duration of the time window is increased starting from a starting value (BMIN) if the current is lower than the threshold value. The duration of the time window is increased until reaching a maximum value (BMAX) for the duration. The duration of the time window is *reduced* if the current is greater than the threshold value.

(See Specification, page 7, lines 5 to 9).

Thus, the duration of the time window is defined so as to not exceed a threshold value, and the duration of the time window is reduced when the current is greater than the threshold value.

As further regards the written description requirement, as explained above, it is respectfully submitted that the Final Office Action has not satisfied the Office's *initial* burden of presenting “evidence or reasons *why* persons skilled in the art would not recognize in an applicant's disclosure a description of the invention defined by the claims.” (See M.P.E.P. § 2163.04 (citing In re Wertheim 541 F.2d 257, 262, 265, 191 U.S.P.Q. 90, 96, 98 (C.C.P.A. 1976))) (emphasis added).

Indeed, the Manual of Patent Examining Procedure itself provides that if an examiner rejects a claim based on the lack of a written description, the examiner should “identify the claim limitation not described” and provide “reasons why persons skilled in the art would not

recognize the description of this limitation in the disclosure of the application.” (See id.). It is respectfully submitted that the Office Action's arguments and assertions simply do not identify why the rejected claims are not supported by the written description of the present application (and its specification) — which it plainly is, as explained herein.

As stated by the Board in Ex parte Harvey, 3 U.S.P.Q. 2d 1626, 1627 (Bd. Pat. App. Int. 1986) (emphasis added, citations omitted):

Compliance with the written description requirement of Section 112 only requires that appellant's application contain sufficient disclosure, *expressly or inherently*, to make it clear to persons skilled in the art that appellant possessed the subject matter claimed. The test for determining compliance with the written description requirement is whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession of the claimed subject matter, *rather than the presence or absence of literal support in the specification for the claimed language.*

Likewise, as stated by the Board in Ex parte Sorenson, 3 U.S.P.Q. 2d 1462, 1463 (Bd. Pat. App. Int. 1987) (emphasis added):

[W]e are mindful that appellant's specification need not describe the claimed invention in *ipsis verbis* to comply with the written description requirement. *The test is whether the originally filed specification disclosure reasonably conveys to a person having ordinary skill that applicant had possession of the subject matter later claimed. . . .* Moreover, the Examiner has the initial burden of presenting evidence or reasons why persons skilled in the art would not recognize in appellant's specification disclosure a description of the invention defined by the claims.

In particular, the Sorenson Board, noting that the examiner only essentially stated that the claim expressions at issue did not “appear in the original disclosure” and that the claim expressions were therefore “not adequately supported by the few specific compounds in the specification”, found that the examiner had not met his initial burden of “presenting evidence why a person having ordinary skill in the art would not recognize in appellant's specification a description of the invention defined by the claims” — and that the “only reasoning

presented” that the Board could discern was an “example of *ipse dixit* reasoning, resting on a bare assertion by the Examiner”.

In view of all of the foregoing, it is respectfully submitted that the Final Office Action's arguments and assertions do not satisfy the evidentiary and judicial standards discussed above, and it is respectfully submitted that the Final Office Action does not establish a prima facie written description case with respect to the present application. It is therefore respectfully submitted that the present application does satisfy the written description requirement of 35 U.S.C. § 112. Accordingly, it is respectfully submitted that the “written description” rejections of the claims should be reversed.

It is therefore respectfully submitted that the Office Action's arguments and assertions simply do not explain why the subject matter of claim 83 and claim 88 is not supported by the written description of the present application — which it plainly is for the reasons discussed herein, so that claim 83 and claim 88 are allowable.

Claims 84, 85 and 87 depend from claim 83, and are therefore allowable for the same reasons as claim 83.

Claims 89 and 90 depend from claim 88, and are therefore allowable for the same reasons as claim 88.

Furthermore, while the specification as originally filed must provide a statutorily sufficient written description of the claimed subject matter to a person having ordinary skill, it does not matter exactly how this is done so long as the written description requirement is satisfied. To determine whether the written description requirement is satisfied, the specification as a whole must be considered. See In re Wright, 9 U.S.P.Q.2d 1649, 1651 (Fed. Cir. 1989) (citing In re Smith, 481 F.2d 910, 914, 178 U.S.P.Q. 620, 624 (C.C.P.A. 1973)).

In this regard, the present application provides, for example, that a “time window within which the switching instant is detected is defined in such a way that detection of the switching instant is possible, yet, the current does not rise to unacceptably high levels,” and further provides that a “duration of the time window is reduced if the current is greater than the threshold value.” (See Specification, page 2, lines 1 to 5 and page 7, lines 5 to 9). Accordingly, it is respectfully submitted that a person having ordinary skill in the art would

understand (especially in view of the specification) that the duration of the time window is defined as to not exceed a threshold value, and that the duration of the time window is reduced when the current is greater than the threshold value.

In view of all of the foregoing, it is respectfully submitted that the Final Office Action's arguments and assertions do not satisfy the evidentiary and judicial standards discussed above, and it is therefore respectfully submitted that the Final Office Action has not established even a prima facie written description case as to the present application.

It is therefore respectfully submitted that the present application does satisfy the written description requirement of 35 U.S.C. § 112, so that claims 83 to 85 and 87 to 90 are allowable.

#### Issue 2 – Definiteness Rejections

Claims 83 to 85 and 87 to 90 were rejected under the second paragraph of 35 U.S.C. § 112 as indefinite.

Claim 83 and claim 88 provide that the duration of the time window is defined so as to not exceed a threshold value, and further provide that the duration of the time window is reduced when the current is greater than the threshold value. The remarks discussed herein as to “defining” the duration of the time window and “reducing” the duration of the time window (as regards the written description rejections) are also referred to here as to the indefiniteness rejections. As described in the specification, a “time window within which the switching instant is detected is defined in such a way that detection of the switching instant is possible, yet, the current does not rise to unacceptably high levels,” and a “duration of the time window is reduced if the current is greater than the threshold value.” (See Specification, page 2, lines 1 to 5 and page 7, lines 5 to 9).

Accordingly, claims 83 and 88 are definite, as are their respective dependent claims.

#### Issue 3 – Anticipation Rejections as the “Rehbichler” Reference

Claims 83 to 85 and 87 to 90 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,592,921 (“Rehbichler”).

As regards the anticipation rejections of the claims, to reject a claim under 35 U.S.C. § 102(b), the Office must demonstrate that each and every claim feature is identically described or contained in a single prior art reference. (*See Scripps Clinic & Research Foundation v. Genentech, Inc.*, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991)). As explained herein, it is respectfully submitted that the prior Office Action does not meet this standard, for example, as to all of the features of the claims. Still further, not only must each of the claim features be identically described, an anticipatory reference must also enable a person having ordinary skill in the art to practice the claimed subject matter. (*See Akzo, N.V. v. U.S.I.T.C.*, 1 U.S.P.Q.2d 1241, 1245 (Fed. Cir. 1986)).

As further regards the anticipation rejections, to the extent that the Final Office Action may be relying on the inherency doctrine, it is respectfully submitted that to rely on inherency, the Examiner must provide a “basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristics *necessarily* flows from the teachings of the applied art.” (*See* M.P.E.P. § 2112; emphasis in original; and *see Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int’f. 1990)). Thus, the M.P.E.P. and the case law make clear that simply because a certain result or characteristic may occur in the prior art does not establish the inherency of that result or characteristic.

Claim 83 provides a method of activating an electromagnetic consumer having a movable element, which includes: determining within a time window a switching instant at which the movable element has reached a certain position, defining a duration of the time window so that the current flowing through the consumer during the time window does not exceed a threshold value, and *reducing the duration of the time window if the current is greater than the threshold value.*

Claim 88 provides an arrangement for activating an electromagnetic consumer having a movable element, which includes: a determining arrangement to determine within a time window a switching instant at which the movable element has reached a certain position, and to define a duration of the time window so that the current flowing through the consumer during the time window does not exceed a threshold value, and *a reducing arrangement to reduce the duration of the time window if the current is greater than the threshold value.*

In contrast the “Rehbichler” reference purportedly concerns a method and a device for actuating an electromagnetic load for influencing metering of fuel in an internal combustion engine. The electromagnetic load is connected with a switch that is supplied with an actuation signal. For identification of a switching time of the electromagnetic load, a parameter which characterizes the actuation signal is evaluated. (Abstract, lines 1 to 7). Furthermore, the “Rehbichler” reference states that in a first time period, until signal CHIL reaches a higher value, a current controller 140 adjusts the current flowing through the solenoid valve to a desired value IS1 prescribed by the control unit. The control unit opens switching arrangement 110 when an upper current threshold is exceeded. Lower current threshold is fluid and is achieved via deactivation of switching arrangement 110 for a specific time TP. When the current value is exceeded the switch opens and after the prescribed time TP the switch closes again. The current I through the solenoid valve oscillates between a prescribed upper threshold and a lower value. (Col. 4, lines 12 to 24).

Accordingly, the “Rehbichler” reference does not identically disclose (or even suggest) the feature in which a duration of a time window is reduced when the current exceeds a threshold value, as provided for in the context of claims 83 and 88. The “Rehbichler” reference merely indicates that until signal CHIL reaches a higher value, the current flowing through the solenoid valve is adjusted to a desired value IS1 prescribed by a control unit such that when the current value is exceeded the switch opens and after a prescribed time TP the switch closes again. Nothing in the “Rehbichler” reference identically discloses the claim feature of reducing a duration of a time window when the current is greater than a threshold value, as recited in the context of claims 83 and 88, as presented.

For the foregoing reasons, the “Rehbichler” reference does not anticipate the subject matter of claims 83 and 88, as presented.

Claims 84, 85 and 87 depend from claim 83, and are therefore allowable for the same reasons as claim 83.

Claims 89 and 90 depend from claim 88, and are therefore allowable for the same reasons as claim 88.

It is therefore respectfully submitted that the “Rehbichler” anticipation rejections of claims 83 to 85 and 87 to 90 should be withdrawn.

Issue 4 – Anticipation Rejections as to the “Fischer” Reference

Claims 83 to 85 and 87 to 90 were finally rejected under 35 U.S.C. § 102(b) as anticipated by Fischer et al., GB 2311559 (“the Fischer reference”).

Claim 83 provides a method of activating an electromagnetic consumer having a movable element, which includes: determining within a time window a switching instant at which the movable element has reached a certain position, defining a duration of the time window so that the current flowing through the consumer during the time window does not exceed a threshold value, and *reducing the duration of the time window if the current is greater than the threshold value.*

Claim 88 provides an arrangement for activating an electromagnetic consumer having a movable element, which includes: a determining arrangement to determine within a time window a switching instant at which the movable element has reached a certain position, and to define a duration of the time window so that the current flowing through the consumer during the time window does not exceed a threshold value, and *a reducing arrangement to reduce the duration of the time window if the current is greater than the threshold value.*

In contrast the “Fischer” reference purportedly concerns a method and an apparatus for controlling an electromagnetic switching member with an excitation winding and a movable armature such that within a time window, a current is evaluated to detect a switching instant at which the armature reaches a new end position. The time window is enlarged when no reliable switching instant is detected within the time window. (Page 2, lines 1 to 7). Furthermore, the “Fischer” reference states that “[t]he measurement window, in particular the beginning FB of the window, cannot be chosen to be as large as desired, since the beginning FB of the window fixes the instant at which the current is regulated down to the holding current” and “[i]f this current is chosen to be too early, the valve does not switch sufficiently rapidly or even not at all.” (Page 6, lines 8 to 12).

Accordingly, the “Fischer” reference does not identically disclose (or even suggest) the feature of a duration of a time window being reduced when the current exceeds a threshold value, as provided for in the context of claims 83 and 88. The “Fischer” reference merely indicates that a measurement window cannot be as large as desired because the



U.S. Pat. App. Ser. No. 09/432,338  
Attorney Docket No. 10191/1157  
Appeal Brief

beginning FB of the window fixes the instant at which the current is regulated down to the holding current. Nothing in the "Fischer" reference identically discloses (or suggests) the claim feature of reducing a duration of a time window when the current is greater than a threshold value, as recited in the context of claims 83 and 88, as presented.

For the foregoing reasons, the "Fischer" reference does not anticipate the subject matter of claims 83 and 88, as presented.

Claims 84, 85 and 87 depend from claim 83, and are therefore allowable for the same reasons as claim 83.

Claims 89 and 90 depend from claim 88, and are therefore allowable for the same reasons as claim 88.

It is therefore respectfully submitted that the "Fischer" anticipation rejections of claims 83 to 85 and 87 to 90 should be withdrawn.

Accordingly, it is respectfully submitted that claims 83 to 85 and 87 to 90 are allowable for the above reasons.

#### CONCLUSION

In view of the above, it is respectfully requested that the rejections of claims 83 to 85 and 87 to 90 be reversed, and that these claims be allowed as presented.

Dated: 1/26/2005

Respectfully submitted,

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**CUSTOMER NO. 26646**

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**APPENDIX**

1-7. (Canceled).

8-82. (Withdrawn)

83. (Previously Presented) A method of activating an electromagnetic consumer having a movable element, the electromagnetic consumer being a solenoid valve for controlling a metering of fuel into an internal combustion engine, the method comprising:

determining within a time window a switching instant at which the movable element has reached a certain position;

defining a duration of the time window so that the current flowing through the consumer during the time window does not exceed a threshold value; and

reducing the duration of the time window if the current is greater than the threshold value.

84. (Previously Presented) The method of claim 83, further comprising: increasing the duration of the time window starting from a starting value if the current is lower than the threshold value.

85. (Previously Presented) The method of claim 84, further comprising: increasing the duration of the time window until a maximum value for the duration is reached.

86. (Canceled).

87. (Previously Presented) The method of claim 85, further comprising: determining the current immediately before an end of the time window.

88. (Previously Presented) An arrangement for activating an electromagnetic consumer having a movable element, the electromagnetic consumer being a solenoid valve for controlling a metering of fuel into an internal combustion engine, the arrangement comprising:

a determining arrangement to determine within a time window a switching instant at which the movable element has reached a certain position, and to define a duration of the time window so that the current flowing through the consumer during the time window does not exceed a threshold value; and

a reducing arrangement to reduce the duration of the time window if the current is greater than the threshold value.

89. (Previously Presented) The arrangement of claim 88, further comprising: an arrangement to increase the duration of the time window starting from a starting value if the current is lower than the threshold value.

90. (Previously Presented) The arrangement of claim 88, wherein the duration of the time window is increased until a maximum value for the duration is reached.